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From: .E. B. Sanders

Subject: .Organization, Programs and Plans for Neuchatel R&D

The Research Center located in Neuchatel, Switzerland, has responsibility for product development and associated research programs for the EEC and EEMA regions. The center consists of 145 people which includes a large QA function.

The laboratory is divided into three functions. The research function, consisting of twenty-six individuals, is handled by a Vice Director who reports to the laboratory Director. Administration support, with ten people, reports to a manager who also reports to the laboratory Director. The largest function, operations services, is composed of 106 people divided into four groups; namely, quality assurance and technical services (69 people), product development (18 people), process development (13 people) and computer application (5 people). The first three groups report to a vice director, while the last group reports to a manager. The complete organizational charts are given at the end of this document.

As might be expected given the size of the research function compared to the size of the overall organization little basic research is carried out at the center. Most of the responsibility of the research personnel is to provide support for product development; that is, to assist the laboratory in making cigarettes better, cheaper and faster. The research function is divided into three groups: microbiology, analytical research and product research. In all three groups the majority of the time is spent in service work and trouble shooting. Research programs which are being pursued are: (1) obtaining natural preservatives for tobacco processing, carried out by the microbiology group; (2) developing on-line analytical measurements for the factory (Infraalyzer), carried out by the analytical group; and (3) studying the effect of cigarette parameters on the amount of certain sidestream smoke components (particularly TSNA) produced in a laboratory setting as well as determining these same components in a variety of normal settings, carried out by the product research group.

The lack of basic research is of considerable concern to some members of the laboratory. It is felt, however, that simply hiring more people would not lead to a significant

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increase in basic research. If this were done it would lead only to more product support work. The recommendation has been made that upper management must mandate increased basic research and that such research would best be done in an external research institute. Reemstma has established such an institute, ERGO, which carries out independent research, contract research for other companies, and research directly for Reemstma. The technology for nitrogen expanded tobacco which Reemstma is now using was developed at ERGO.

Discussion of the Operations Service function will be restricted to the Product Development group, since it is this group which has the responsibility for the development of new products. The European market is facing many of the same problems that the USA market is experiencing, although there is a time lag of several years. The Lausanne economic group predicts that by 1995 industry sales in the EEC region will decline by 7%. The situation, of course, differs from country to country. For instance, while in Germany sales are still increasing slowly, sales are flat in France. Italy, which has the highest antismoking pressure in the EEC region, is exhibiting sales declines. Between May 1986 and May 1987, industry sales in Italy declined 3-7%. The sharp differences among countries requires that different marketing strategies be developed for each country. For instance, Philip Morris is doing extremely well in Germany. The low tar market is growing rapidly in Germany, and Philip Morris with two new low tar products - Marlboro Lights and Philip Morris Extra - is doing extremely well. The five year marketing strategy for Germany is to increase market share of young smokers (under 20) from 40 to 53% and to introduce two new brands - a non filtered Marlboro and a cigarette which will appeal to female smokers.

There is a central product innovation task force for the EEC region which is handled by the marketing group. Although the relationship between this group and the PM Europe R&D product development group is quite good, the product development group is convinced that the best potential new products will emerge via an R&D push as opposed to a marketing pull. There is also a product innovation group with R&D. Its responsibility is not to develop new ideas but rather to implement new ideas. (It should be noted that assisting the product development group is an individual carrying out modeling studies. Computer models have been developed which predict smoking properties based on blend composition.) The two current priority programs in progress at this time are the tube-in-tow filter and the high density cigarette. Use of the tube-in-tow filter has allowed the construction of an ultra low tar cigarette (2 mg) with a flat puff-by-puff profile. This product is in consumer testing at this time. The high density, short cigarette uses less tobacco to deliver the same amount of mainstream tar as compared to a normal cigarette, although puff count is slightly lower. Subjectives are improved. In addition all measured sidestream components (CO,

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NH_3, APM, NO, etc.) except nicotine are reduced by 40 to 50%. These product advantages have not appeared to be sufficient to allow marketing to sell the product. Other concepts which are being explored have a familiar ring to them such as a distinctively flavored cigarette, a premium product, low tar/high taste and a reduced sidestream cigarette.

The product development group is pursuing some extremely interesting ideas pertinent to the problem of developing and testing new products. It is in the process of using a formalized system to select combinations of existing technology for the design of products with significant advantages. Every existing technology (e.g., ventilation, filter design technology) is being listed. Each technology is then rated as to how it affects (positively, negatively, or no effect) certain cigarette properties such as mainstream taste, mainstream impact, MS/SS ratio, CO, puff profile, etc. Secondly, each technology is rated on a five point scale as to its status ranging from completely experimental to universally in use. Lastly these technologies are rated on a 3x3 grid which relates attractiveness (i.e., impact on product) to strength (i.e., how strong is Philip Morris in that particular technology). In this way it is hoped that feasible new product ideas will emerge. This study will be completed for presentation at the Greenbrier meeting in late August.

With regard to product testing there is concern that insufficient product oriented market research is carried out, and that product testing is not done properly in Europe. PM Europe R&D is now using a monadic attribute evaluation system. A smoker is asked to rate product attributes on a straight line constructed in such a way that a mid-line response would be ideal. This technique was used to develop a Virginia type cigarette for the UK which was to have been designed to compete with an existing product. Smokers of the existing product were asked to rate their own cigarette using this technique. Repeat tests were found to be surprisingly reproducible. Those attributes which were found to deviate significantly from a mid-line response were then taken as the objectives for the new product. When a cigarette had been designed which gave considerably improved ratings by smokers of the existing brand, it was submitted for blind product testing against the commercial brand. The test cigarette was preferred 75/25. Unfortunately this cigarette has not yet been introduced into the UK because of financial problems unique to the UK market.

With regard to new products the Vice Director of Product Development stressed that there are two distinct types of product advantages which he labels offensive and defensive. Strategies related to these two types of advantages should be quite distinct. Marketing should be concerned only with short term aggressive innovations, and should use these concepts as the basis for new products. R&D and Operations should be concerned with defensive strategies. Defensive alterations

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which can be incorporated at a low level without leading to a subjective difference should be done to all our products simultaneously. The following year additional changes can be effected. For instance, rather than have as a strategic goal a free-standing brand with 75% reduction in sidestream visibility, all Philip Morris brands should be modified to achieve perhaps a 10% reduction in sidestream visibility; that is, the largest reduction which can be achieved without a perceptual subjective difference. The following year, the 10% reduction can be increased to a 20% reduction. Eventually, all PM brands may achieve a 75% reduction without, (1) the consumer being aware of the changes, and (2) with the consumer of the opinion that no subjective alteration had occurred. This strategy was used effectively to bring all PM products up to their present utilization of sheet materials.

Considerable attention is devoted to European competitors. Competitors in the EEC region are patenting much more aggressively than is Neuchatel R&D. In addition we are not fighting some of these patents effectively enough. This aggressive posture by our competitors is a result of the fact that at this time most of them in the EEC have been suffering with respect to sales because of Philip Morris. There are indications that BAT will market Capri in Europe, and that Reynolds will market a low sidestream product. It should also be noted that despite PM's considerable success one of the fastest growing cigarette in Europe is Camel.

The largest department at Neuchatel R&D is Quality Assurance and Technical Services. This department is divided into four divisions; Incoming Control (21), Product Quality Audit (36), QC FTR (1) and Manufacturing Services (6). The overall objective of the Quality Assurance department is to ensure that the highest quality is achieved in all aspects of the business. Maintaining high quality is an important strategic goal. The Incoming Control Division is divided into four groups; namely, analytical services with six people, new tobacco materials with seven people, the tobacco monitoring group with seven people, and entomology which has one person. Programs for the Incoming Materials Division are: (1) review and better define incoming inspection procedures for materials in Europe to allow R&D to reduce their efforts so that most of the responsibilities can be transferred to the suppliers; (2) develop an increased understanding of adhesives; (3) review all analytical procedures and all quality problems to determine if there are unnecessary analyses currently being conducted, or analyses not being done which should be done; (4) tobacco lot analysis and tobacco quality analysis, and (5) relate physical characteristics with production yields.

Programs for the Quality Audit Division are: (1) to review data worldwide to ensure that standard quality ratings are being used; (2) to ensure that the quality audit correctly reflects customer concerns; (3) to review panel procedures and ensure that information gained is being used properly; and (4)

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robotics. Manufacturing Services sets specifications for products.

A summary of my visit is given below:

1. R&D Neuchatel will not undertake basic research. It plans, however, to utilize the Cologne laboratory for such research, and anticipates that Philip Morris USA R&D will assist.

2. There is a strong desire to strengthen ties between R&D and marketing. One possible way to do this is to transfer an R&D person to PMI marketing in New York for six months.

3. All groups will spend considerable time with their customers. As time progresses many product ideas will emerge via an R&D push as opposed to a marketing pull.

4. There is considerable need to strengthen ties with PM USA R&D. Several possible ways of doing this are by exchange of personnel, mutual visits and joint meetings.

5. All new programs will be discussed with PM USA R&D before implementation. Richmond R&D would be expected to give input and advice. If possible Richmond should provide active consulting and hands-on assistance.

6. Neuchatel R&D will adopt a planning structure similar to that being developed at PM USA R&D.

7. New product development for EEC and EEMA has been more successful than for USA because direct government intervention abroad is more common.

Based on this visit several recommendations concerning the R&D Strategic Plan can be made.

1. A close relationship between R&D and marketing worldwide including USA must be developed.

2. PM USA R&D needs to strengthen its product and process development for international regions outside of EEC and EEMA.

3. Improved consumer testing must be made a high priority for PM USA R&D.

4. Close cooperation between R&D in Richmond and Neuchatel must be maintained.

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5. In that PM USA is the only R&D organization worldwide which can carry out basic research, a significant basic research effort must be maintained.

6. All groups within PM USA should cultivate a close relationship with their customers.

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